LMSR RAMP AND CRANE DATA

The ramps and cranes on all of the large, medium speed RORO (LMSR) ships are class standard equipment.

SIDEPORT RAMP

The sideport ramp system includes the port and starboard sideport doors, port and starboard platforms, a multi-section ramp with associated equipment and the controls to operate them. The system is designed to be operational within 2 hours from the stowed and deployed position. The ramp is capable of RORO operations when the ship has adverse list of up to 2 degrees and trim of up to 1 degree.

The sideport ramp is designed to support an M1A1 Abrams main battle tank towing another M1A1 anywhere on the driveway surface of the ramp and platform. The system will allow vehicle access to a RRDF deck surface which is a minimum of two feet above the waterline. The ramp permits access to pier surfaces anywhere from 2 to 23 feet above the waterline and is capable of clearing a curb 15 inches high by 15 inches wide along the edge of a pier.

The ramp has a clear driveway width of 18 feet. The clear ramp width of the upper section is flared on the upper 32 feet to a clear driveway width of approximately 31 feet to facilitate transition to and from the sideport platform and to allow greater mobility while turning vehicles.

The articulated ramp foot is provided with herringbone-pattern traction bars to prevent slippage. The underside has a flat contact area that is sufficient to limit the contact pressure to 500 pounds per square foot (PSF) on the pier during RORO operations. The weight of the ramp foot by itself, on the pier or RRDF, with no vehicles, is approximately 133,565 pounds. In the long ramp configuration, the maximum weight exerted by the ramp foot is less than 150 long tons without any vehicles on the ramp.

Ramp operations are limited to a 12-degree downward slope.

There are two sideport doors, port and starboard. They are 16' high by 40' wide and are top-hinged, opening out and up. The sideport platforms are 50' long by 40' wide and are bottom-hinged, opening out and down. The three sides of the platform are suitable for hinge-type attachment of the upper section of the sideport ramp. The hinged platforms are stowed vertically, directly outboard of the sideport doors.

Sideport Ramp System Configuration: the multi-section ramp is capable of being assembled in three configurations and in as many as three different positions (forward, outboard and aft).

a. Short-Ramp Configuration: The short ramp configuration consists of the upper ramp section with the articulated ramp foot section connected to the

upper ramp. When assembled in the short ramp configuration, the ramp is 35' long and weighs 35 long tons.

b. Medium-Ramp Configuration: The medium ramp configuration consists of the upper and lower ramp sections, which are rigidly connected to form a single, continuous ramp. The articulated ramp foot section is connected to the lower ramp section. When assembled in the medium ramp configuration, the ramp length is 70 feet long and weighs 55 long tons.

c. Long-Ramp Configuration (preferred): The long-ramp configuration includes the upper, center, and lower ramp sections rigidly connected to form a single continuous ramp. The articulated ramp foot section is connected to the lower ramp section. When assembled in the long-ramp configuration, the ramp length is 165 feet and weighs approximately 110 long tons.

The ramp lengths are measured between the centerlines of the kingpin located at the platform end of the upper ramp section and the hinge of the ramp foot section. The length of the ramp foot section is not included

Sideport Ramp Positions and Configurations

- Forward Position. In the forward position the ramp is attached to the forward side of the sideport platform oriented approximately parallel to the ship's centerline with an outboard slew of approximately 5 degrees due to the trapezoidal shape of the sideport platform.
- Outboard Position. In the outboard position the ramp is attached to the outboard side of the sideport platform and is oriented approximately perpendicular to the ship's centerline.
- Aft Position. In the after position the ramp is attached to the aft side of the sideport platform oriented approximately parallel to the ship's centerline with an outboard slew of approximately 5 degrees due to the trapezoidal shape of the sideport platform.

Sideport Ramp Configuration	Sideport Ramp Position	Deployed to Pier	Deployed to RRDF
Long Ramp	Forward	Yes	No
	Outboard	No	No
	Aft	Yes	Yes
Medium Ramp	Forward	Yes	No
	Outboard	No	No
	Aft	Yes	No
Short Ramp	Forward	No	No
	Outboard	Yes	No
	Aft	No	No

Note: The short and medium versions of the ramp may be used along side a pier when the angle of the driveway surface of the ramp will not exceed 12 degrees in the lightship arrival or departure condition.

SLEWING STERN RAMP SYSTEM

The stern ramp system is an integrated slewing stern ramp systems that includes an articulated ramp assembly, a stern door, and articulating equipment and controls. The ramp system is capable of performing RORO operations to or from a pier on in-the-stream to lighterage in conditions up to Sea State 3. The system is capable of deploying and retrieving the system and performing RORO operations when the ship has adverse list of up to 5 degrees.

The system supports tow cargo-handling trucks with maximum loads, placed contiguously anywhere on the stern ramp driveway surface. It also supports an M1A1 tank towing another M1A1 tank anywhere on the ramp driveway surface. When fully extended, the stern ramp is 24 feet wide (outside width – 29 feet) and 135 feet long, and consists of two ramp sections plus the foot section. The foot section is 20 feet long and 36 feet wide. The ramp foot has sufficient flat surface area on the underside to limit contact pressure to 500 psf on the pier during RORO operations. The ramp is provided with welded-on herringbone pattern traction bars. The ramp is configured to provide access to an RRDF deck surface that is two feet above the waterline and allows access to pier surfaces between 2 and 23 feet above the waterline. The stern ramp system has been designed to clear a curb 15 inches high by 15 inches wide along the edge of the pier. When operating pierside, the ship must be at a maximum of 8 feet from the pier. When operating in-the-stream with an RRDF, the stern ramp must be deployed dead astern.

The ramp is attached to a turntable that allows a slewing range of 39 degrees to port and 39 degrees to starboard. The ramp articulation is capable of a maximum angle of 15 degrees and has a minimum clear roadway width of 24 feet.

The stern door is a single-paneled, top-hinged enclosure located forward of the slewing stern ramp. The stern door is symmetrical with the ship centerline and has a minimum clear opening of 16 feet high and 40 feet wide.

The ramp may be fully deployed within 30 minutes from the stowed position. It may be fully stowed within 30 minutes from its deployed position. The maximum operating angle of the ramp is 12 degrees from horizontal.

The stern ramp system can be configured for RORO operations either from/to a pier or a RRDF. When the system is deployed to a RRDF, it must be locked in the dead-astern position. When the system is deployed for RORO operations to a pier, it may be slewed either port or starboard and then set to operate in the automatic pierside mode. In the automatic pierside mode, the deployed ramp automatically maintains proper ramp configuration. A control system senses the pier surface height and adjusts the ramp angles accordingly.

SINGLE-PEDESTAL TWIN CRANES

Two electrohydraulic Single-Pedestal Twin Cranes are installed. These two sets of pedestal-mounted, twin-boom cranes service three cargo hatches. Each hatchway is within reach of at least one, single-pedestal twin crane. Each of the cranes is capable of independent operation, or each pair may be operated in tandem. The single-pedestal twin cranes are capable of handling cargo and deploying and stowing the sideport ramp, causeway sections, and warping tug. The cranes are rated for lifts in Sea State 3 conditions. Each crane is capable of operation with 5 degrees of list and 2 degrees of trim. The cranes are capable of handling ammunition containers. The minimum operating radius is 20 feet.

Crane Capacities

Operating Radius	Capacity
20 to 95 feet, single crane mode	57 long tons
95 to 130 feet, single crane mode	36.5 long tons
20 to 95 feet, tandem (twin) crane mode	113 long tons
95 to 130 feet, tandem (twin) crane mode	72 long tons

Each crane is provided with a Rider Block Tagline System (RBTS) to minimize horizontal load swing. This system includes a rider-block which can be raised and lowered along the hoist lines and is restrained from horizontal movement with two power adjustable taglines reeved from the ends of a horizontal RBTS beam at the base of each crane.

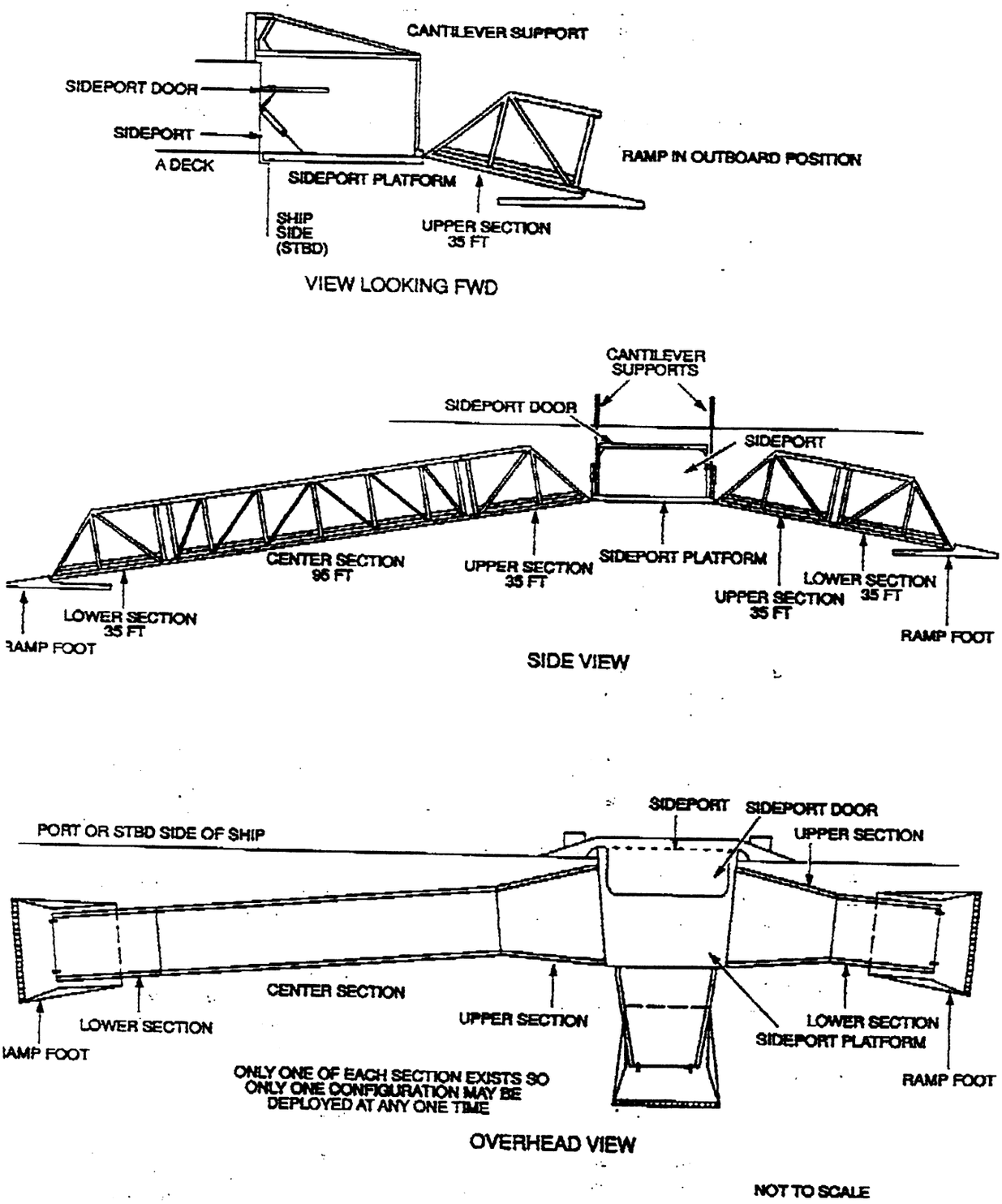

Figure 2-3. Sideport Ramp System

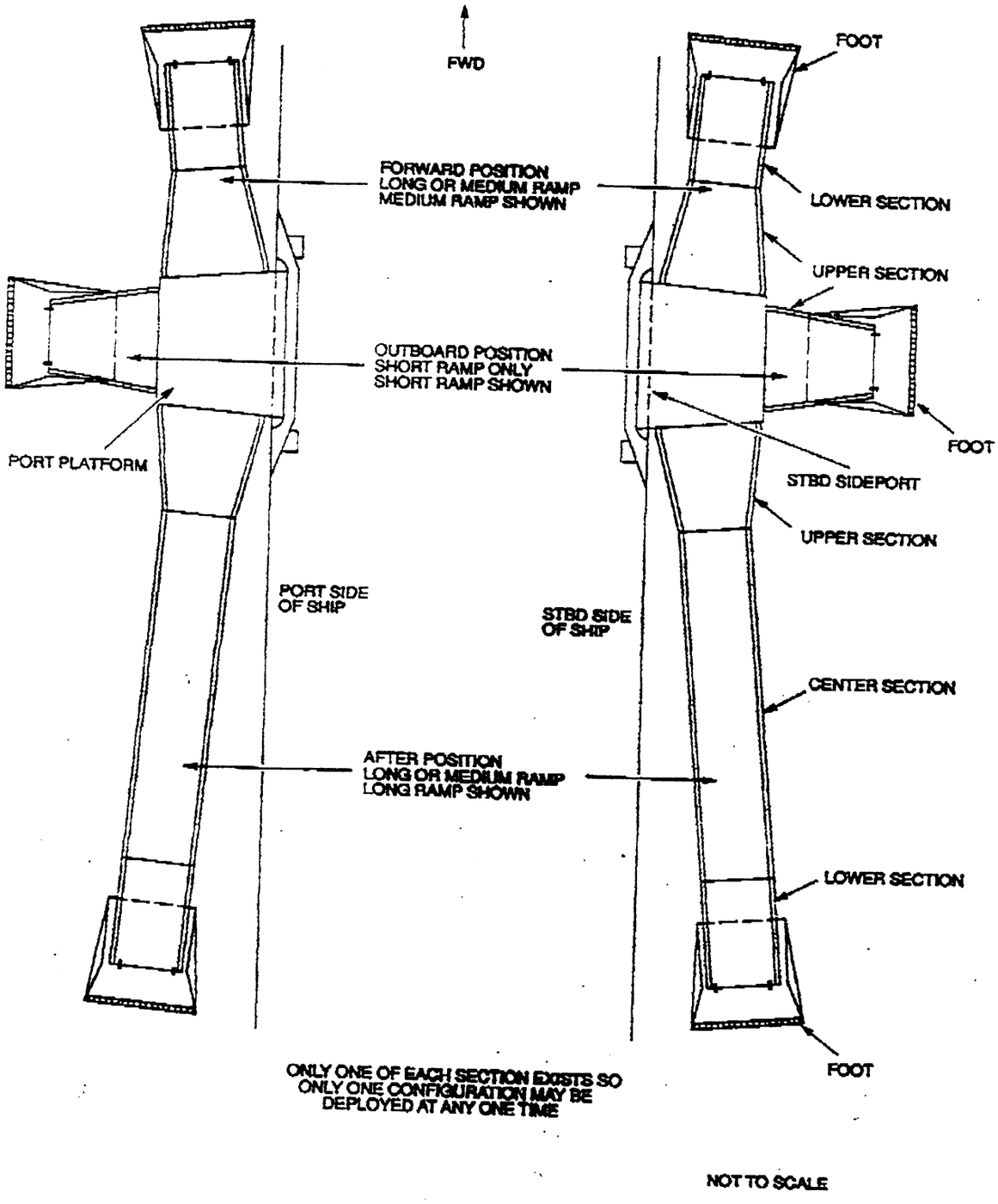

Figure 2-4. Portable Sideport Ramp System, Deployed Positions

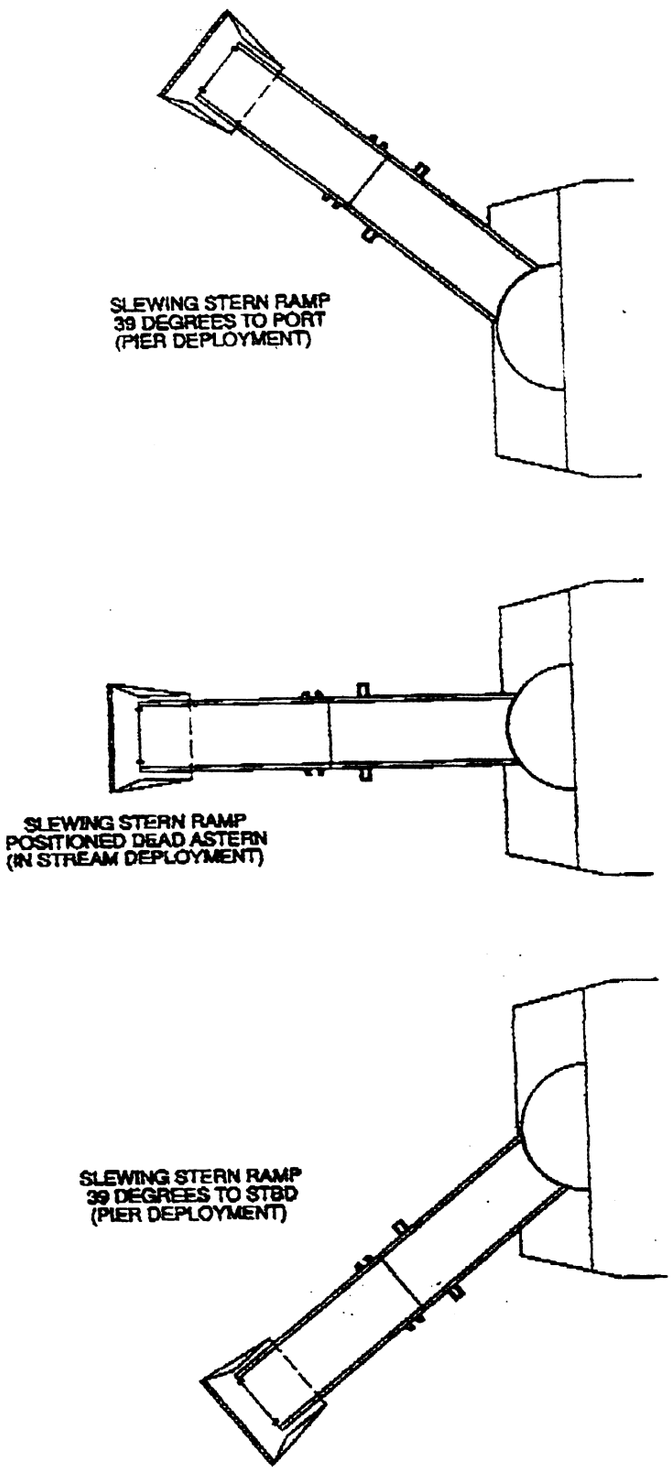

Figure 2–5. Slewing Stern Ramp System

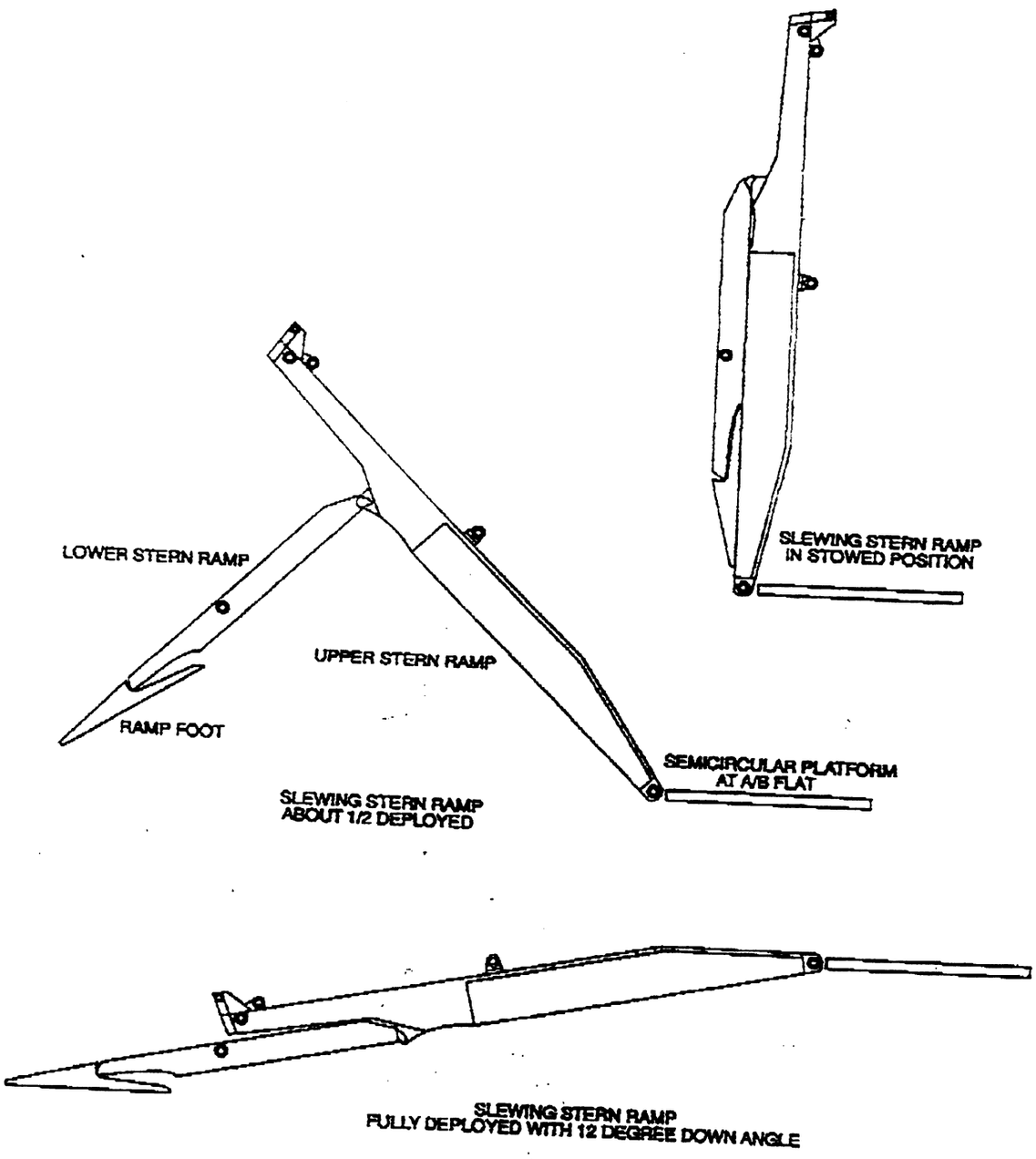

Figure 2–6. Slewing Stern Ramp (Side View)

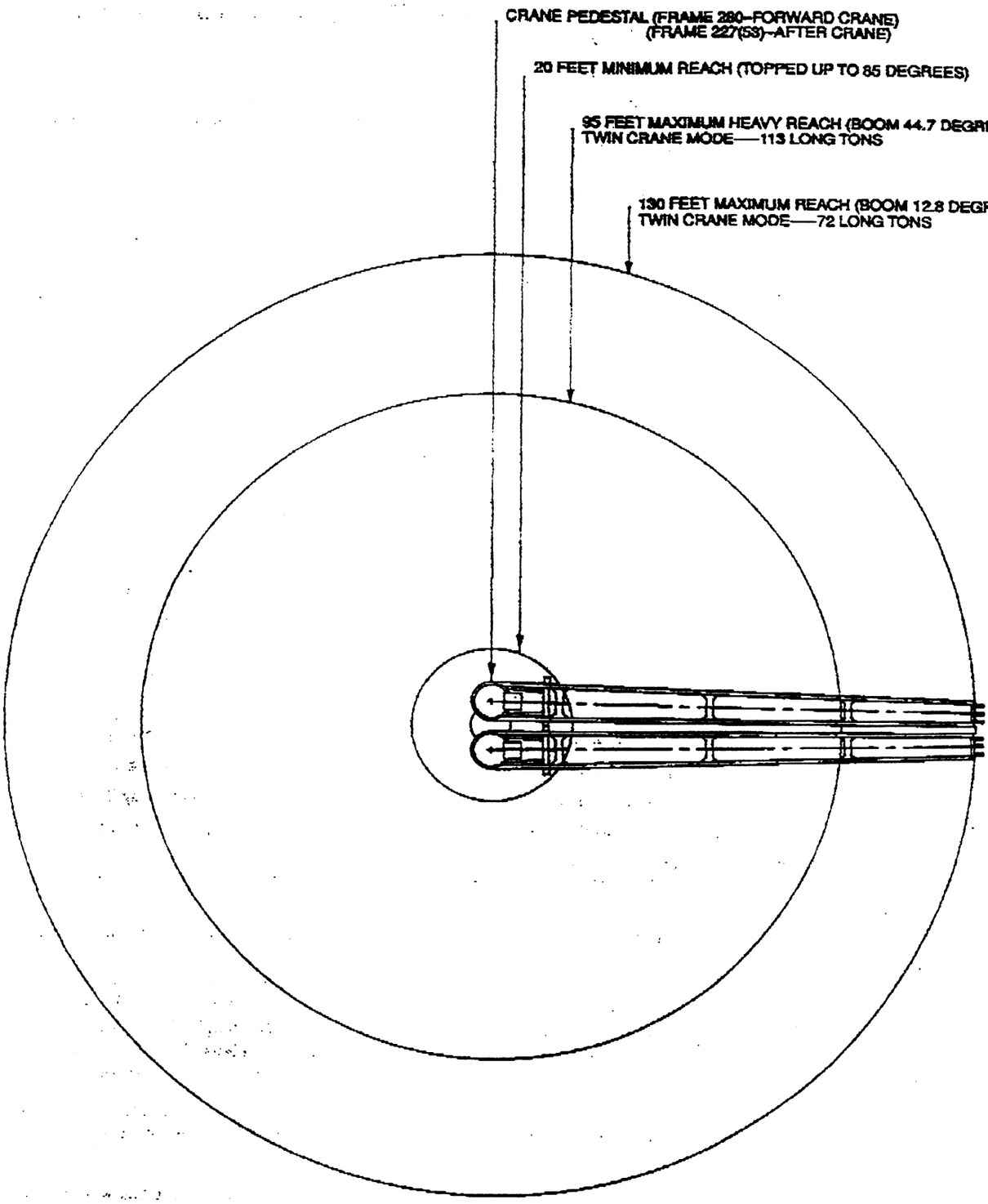

Figure 2–7. Crane Lifting Radius and Capacity (Twin Mode)

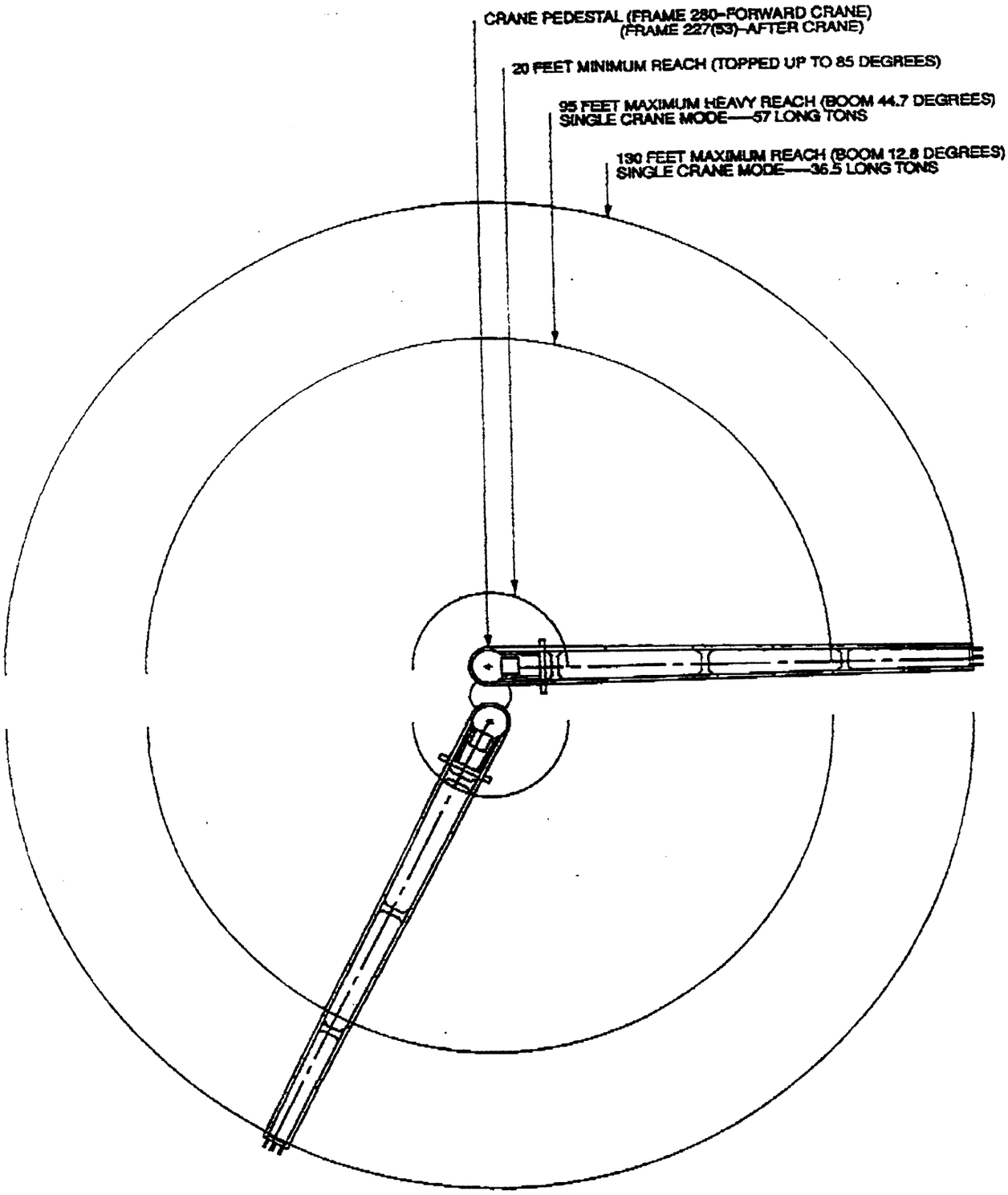

Figure 2–8. Crane Lifting Radius and Capacity (Single Mode)

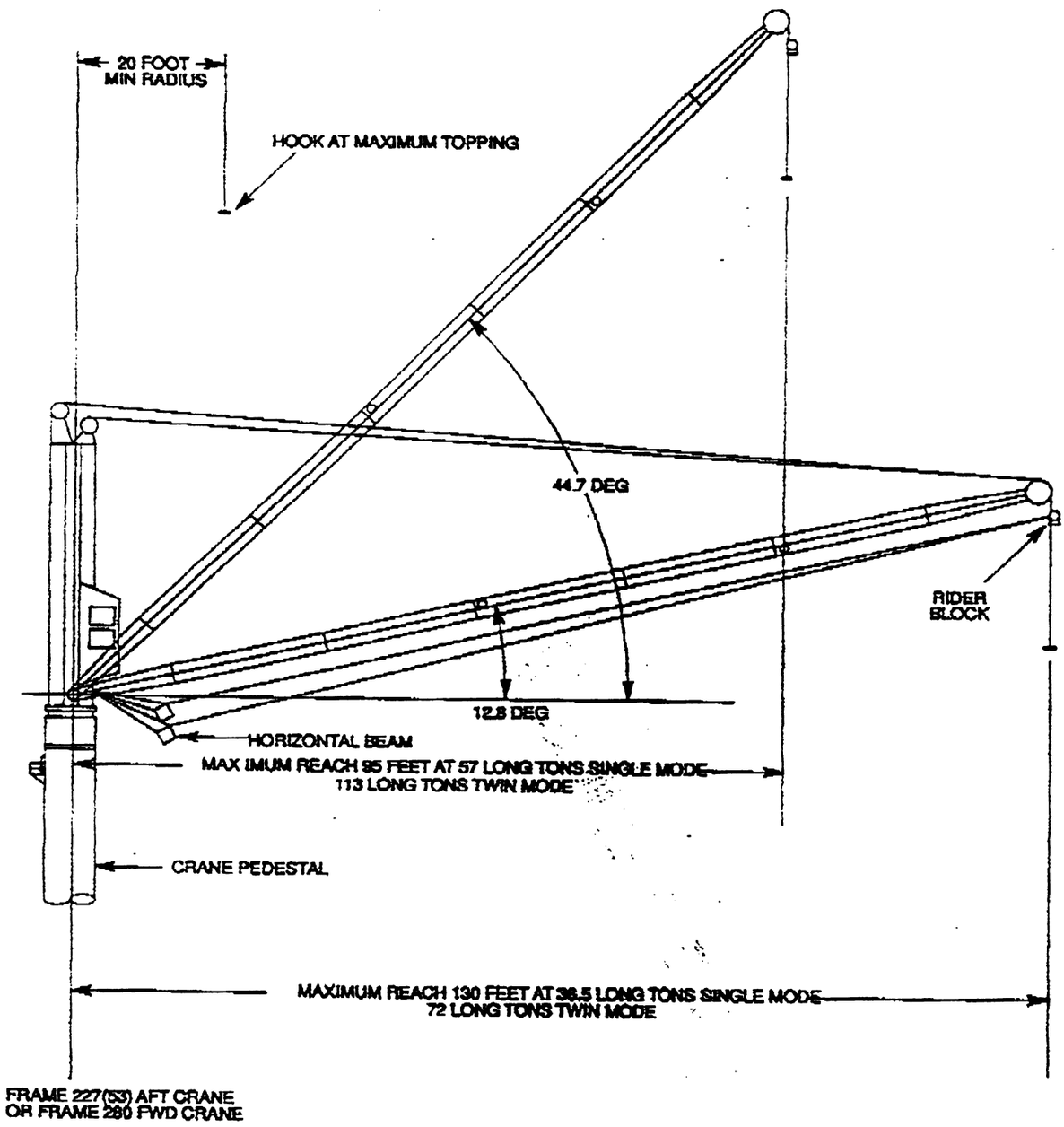

Figure 2–9. Single–Pedestal Twin Crane